

AMENDMENTS TO THE CLAIMS

1. (Original) An electric syringe for injecting a dental anesthetic by pressing a rubber plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint of a dental needle connected to the cartridge, the electric syringe comprising:

a push member configured to press and move the rubber plug of the cartridge;

a drive motor configured to generate a drive force;

a transmission mechanism part configured to transmit the drive force to the push member;

and

a control unit configured to control a moving of the push member by controlling the drive motor,

wherein the control unit controls the drive motor to move the push member to gradually increase an injection speed of the anesthetic in the beginning of the injection and to move the push member to inject the anesthetic in a constant injection speed after a predetermined time has elapsed.

2. (Original) The electric syringe as claimed in claim 1 further comprising a sound output unit configured to output a sound,

wherein the control unit controls the sound output unit to output the sound during the injection of the anesthetic.

3. (Original) The electric syringe as claimed in claim 1 further comprising an operation switch having a window hole portion and a sensor of a light reflection type in which detects whether or not the window hole portion is closed,

a ball pusher biasing member arranged in the tube body of the connecting ring;

a ball pusher arranged in the tube body of the connecting ring, applied with a biasing force by the ball pusher biasing member in the opposite direction to a connection direction of the cartridge holder, and formed in a cylindrical body shape having a multi-stage-shaped outer peripheral surface;

a mounting and removing ring biasing member arranged outside of the tube body of the connecting ring;

a mounting and removing ring arranged outside the tube body of the connecting ring, applied with a biasing force by the mounting and removing ring biasing member in the opposite direction to the connection direction of the cartridge holder, and formed in a cylindrical body shape having an inner peripheral surface with a groove;

a first ball arranged in the connecting ring in a manner to be movable between the multi-stage-shaped outer peripheral surface of the ball pusher and the grooved inner peripheral surface of the mounting and removing ring; and

a second ball arranged in the connecting ring in a manner to be movable between the grooved outer peripheral surface of the cartridge holder and the grooved inner peripheral surface of the mounting and removing ring,

wherein when the cartridge holder is connected, the cartridge holder presses against the ball pusher and thus the cartridge holder and the ball pusher are moved in linking with each other to thereby move the first ball to the ball pusher side and the second ball to the cartridge holder side, and

wherein when the cartridge holder is connected, the mounting and removing ring released from the movement restraint by the first ball is moved in the opposite direction to the cartridge insertion direction to press against the first and second balls, thereby connecting the cartridge holder to the cartridge holder connecting part.

15. (New) An electric syringe for injecting a dental anesthetic by pressing a rubber plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint of a dental needle connected to the cartridge, the electric syringe comprising:

- a push member configured to press and move the rubber plug of the cartridge;
- a drive motor configured to generate a drive force;
- a transmission mechanism part configured to transmit the drive force to the push member;
- a control unit configured to control a moving of the push member by controlling the drive motor,

wherein the control unit controls the drive motor to move the push member to gradually increase an injection speed of the anesthetic in the beginning of the injection and to move the push member to inject the anesthetic in a constant injection speed after a predetermined time has elapsed; and

- a sound output unit configured to output a buzzing or melodic sound,

wherein the control unit controls the sound output unit to output the sound during the injection of the anesthetic.

16. (New) The electric syringe as claimed in claim 1 further comprising:

a cartridge holder connecting part; and

a cartridge holder configured to hold one of a plurality of cartridges having different lengths, and configured to be connectable to the cartridge holder connecting part.

17. (New) The electric syringe as claimed in claim 16, wherein the cartridge holder is configured to hold one of a first cartridge filled with 1.0 ml of the anesthetic and a second cartridge filled with 1.8 ml of the anesthetic.

18. (New) An electric syringe for injecting a dental anesthetic by pressing a rubber plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint of a dental needle connected to the cartridge, the electric syringe comprising:

a push member configured to press and move the rubber plug of the cartridge;

a drive motor configured to generate a drive force;

a transmission mechanism part configured to transmit the drive force to the push member;

a control unit configured to control a moving of the push member by controlling the drive motor,

wherein the control unit controls the drive motor to move the push member to gradually increase an injection speed of the anesthetic in the beginning of the injection and to move the push member to inject the anesthetic in a constant injection speed after a predetermined time has elapsed; and

an operation switch having a window hole portion and a sensor of a light reflection type in which detects whether or not the window hole portion is closed,

wherein the control unit starts the injection of the anesthetic when the sensor of the operation switch detects that the window hole portion is closed.

19. (New) An electric syringe for injecting a dental anesthetic by pressing a rubber plug of a cartridge filled with an anesthetic, thereby injecting the anesthetic from a needlepoint of a dental needle connected to the cartridge, the electric syringe comprising:

- a push member configured to press and move the rubber plug of the cartridge;

- a drive motor configured to generate a drive force;

- a transmission mechanism part configured to transmit the drive force to the push member, comprising:

- a lock removing button arranged on a cover case of the electric syringe; and

- a clutch mechanism portion configured to release the transmission of the drive force when the lock removing button is operated; and

- a control unit configured to control a moving of the push member by controlling the drive motor,

wherein the control unit controls the drive motor to move the push member to gradually increase an injection speed of the anesthetic in the beginning of the injection and to move the push member to inject the anesthetic in a constant injection speed after a predetermined time has elapsed.